

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

D.J. Biswas et al.

Confirmation No.: 6897

Application No.: 10/612,848

Art Unit: 2828

Filed: July 3, 2003

Examiner: Rodriguez, Armando

For: A PULSER DRIVEN, HELIUM FREE TRANSVERSELY EXCITED  
ATMOSPHERIC-PRESSURE (TEA) CO<sub>2</sub> LASER

Attorney Docket No.: 3875.023

Customer No.: 000041288

REQUEST FOR CORRECTION OF BIBLIOGRAPHIC DATA

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Applicants note errors in the captured bibliographic information as appears on the BIBDATASHEET, and, accordingly, request correction for the above-identified application as follows:

Notice of Allowance - Correct Title to read as follows:

A PULSER DRIVEN, HELIUM FREE TRANSVERSELY EXCITED  
ATMOSPHERIC-PRESSURE (TEA) CO<sub>2</sub> LASER

- a copy of the transmittal letter dated July 3, 2003, a copy of the first page of the application, and the Declaration and Power of Attorney, all showing the correct title thereon, are provided herewith.

U.S. Application No. 10/612,848  
REQUEST FOR CORRECTION OF BIBLIOGRAPHIC DATA

Attorney Docket No.: 3875.023

**Declaration and Power of Attorney**

**Applicants' City - should be corrected to read as follows:**

MUMBAI - although the Declaration lists the mailing address city as MUMBIA for the first two inventors, this is an obvious typographical error.

A copy of the Declaration and Power of Attorney with the changes noted thereon is provided herewith.

**Official Filing Receipt**

**First and Second Inventors - City spelled incorrectly - should be corrected to read as follows:**

MUMBAI - Official Filing Receipt lists city as MUMBIA - this is an obvious typographical error.

**Second Inventor - Name should be corrected to read as follows:**

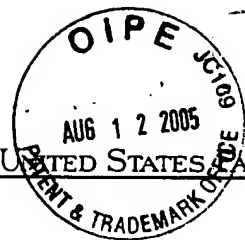
JONNALAGADDA PADMA NILAYA

- while original Declaration is correct, Official Filing Receipt lists inventor's name as JONNAIAGADDA PADNIA NILAYA

**Title - Correct Title to read as follows:**

A PULSER DRIVEN, HELIUM FREE TRANSVERSELY EXCITED  
ATMOSPHERIC-PRESSURE (TEA) CO<sub>2</sub> LASER

- title is correct in all papers filed by Applicants.



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APPL NO.	FILING OR 371 (c) DATE	ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	DRAWINGS	TOT CLMS	IND CLMS
10/612,848	07/03/2003	2828	750	3875.023	6	12	1

Stephen A. Pandorf  
Pandorf & Cutliff  
5111 Memorial Highway  
Tampa, FL 33634-7356

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JAN 19 2004  
BY: .....

CONFIRMATION NO. 6897

FILING RECEIPT



\*OC000000011688046\*

Date Mailed: 01/14/2004

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Office of Initial Patent Examination's Filing Receipt Corrections, facsimile number 703-746-9195. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

## Applicant(s)

*MUMBAI*  
Dhruba J. Biswas, Mumbai, INDIA;  
Jonnaigadda Padma Nilaya, Mumbai, INDIA;  
Aniruddha Kumar, Thane, INDIA;

*MUMBAI*

Domestic Priority data as claimed by applicant

Foreign Applications

If Required, Foreign Filing License Granted: 11/21/2003

Projected Publication Date: 01/06/2005

Non-Publication Request: No

Early Publication Request: No

## Title

*A* Pulsar driven, helium free transversely excited atmospheric-pressure (TAE) CO<sub>2</sub> laser

*(TEA) CO<sub>2</sub>*

Preliminary Class

Complete and send this form, together with

applicable fee(s), to: Mail

Mail Stop ISSUE FEE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
or Fax (703) 746-4000

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below, or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance notifications.

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Stephen A. Pandorf  
Pandorf & Cutliff  
5111 Memorial Highway  
Tampa, FL 33634-7356

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**Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (703) 746-4000, on the date indicated below.

Stephan A. Pandorf

(Depositor's name)

(Signature)

August 10, 2005

(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,848	07/03/2003	Dhruba J. Biswas	3875.023	6897

TITLE OF INVENTION: PULSER DRIVEN, HELIUM FREE TRANSVERSELY EXCITED ATMOSPHERIC-PRESSURE (TAE) CO<sub>2</sub> LASER

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1400	\$300	\$1700	08/10/2005

EXAMINER	ART UNIT	CLASS-SUBCLASS
RODRIGUEZ, ARMANDO	2828	372-082000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

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3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Secretary, Department of Atomic Energy  
Government of India

INDIA

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are enclosed:

- ☒ Issue Fee
- ☒ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s):

- ☐ A check in the amount of the fee(s) is enclosed.
- ☒ Payment by credit card. Form PTO-2038 is attached.
- ☒ The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number 16-0877 (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above. NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature \_\_\_\_\_

Date August 10, 2005

Typed or printed name Stephan A. Pandorf

Registration No. 32,665

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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## \*BIBDATASHEET\*

Bib Data Sheet

CONFIRMATION NO. 6897

SERIAL NUMBER 10/612,848	FILING DATE 07/03/2003  RULE	CLASS 372	GROUP ART UNIT 2828	ATTORNEY DOCKET NO. 3875.023
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## APPLICANTS

*Mumbai*  
Dhruba J. Biswas, *Mumbai*, INDIA;  
~~JOYMALAGADDA PADMA~~ *Mumbai*  
Jonnaiagadda Padma Nilaya, *Mumbai*, INDIA;  
Aniruddha Kumar, Thane, INDIA;

\*\* CONTINUING DATA \*\*

\*\* FOREIGN APPLICATIONS \*\*

IF REQUIRED, FOREIGN FILING LICENSE GRANTED

\*\* 11/21/2003

Foreign Priority claimed <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	STATE OR COUNTRY INDIA	SHEETS DRAWING 6	TOTAL CLAIMS 12	INDEPENDENT CLAIMS 1
35 USC 119 (a-d) conditions met <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> Met after allowance	Verified and Acknowledged <i>AK</i> Examiner's Signature	<i>AK</i> Initials		

## ADDRESS

Stephen A. Pandorf  
Pandorf & Cutliff  
5111 Memorial Highway  
Tampa, FL  
33634-7356

## TITLE

(TEA) CO<sub>2</sub>A Pulsar driven, helium free transversely excited atmospheric-pressure (TAE) CO<sub>2</sub> laser

FILING FEE  RECEIVED 750	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:	<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees ( Filing ) <input type="checkbox"/> 1.17 Fees ( Processing Ext. of time ) <input type="checkbox"/> 1.18 Fees ( Issue ) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit
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ATTORNEYS AT LAW

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Reply To: Tampa Office

July 3, 2003

## MAIL STOP PATENT APPLICATION

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Re: Rule 1.53(b) Nonprovisional Patent Application  
Application of D. J. BISWAS, J. P. NILAYA, and A. KUMAR  
Entitled "A PULSAR DRIVEN, HELIUM FREE TRANSVERSLY EXCITED  
ATMOSPHERIC-PRESSURE (TEA) CO<sub>2</sub> LASER"  
Our Ref.: 3875.023

Dear Sir:

This is a request for the filing of a Nonprovisional Application by Applicants D. J. BISWAS, J. P. NILAYA, and A. KUMAR, entitled "A PULSAR DRIVEN, HELIUM FREE TRANSVERSLY EXCITED ATMOSPHERIC-PRESSURE (TEA) CO<sub>2</sub> LASER."

This application is being filed under 37 CFR §1.53(b). We enclose the specification (13 pages), claims (2 pages), abstract (1 page) and a copy of the executed Declaration and Power of Attorney.

Total claims .....	<u>13</u> - <u>20</u> = <u>0</u> x \$18 = \$
Independent Claims .....	<u>1</u> - <u>3</u> = <u>0</u> x \$80 = \$
Base Fee .....	\$ 750.00
<b>TOTAL FILING FEE .....</b>	<b>\$ 750.00</b>

A check for the statutory fee of \$750.00 is attached. You are also directed and authorized to charge or credit any difference or overpayment to Deposit Account No.

Commissioner for Patents  
July 3, 2003  
Page 2.

Attorney docket: 3875.023

16-0877. The Commissioner is hereby authorized to charge any fees under 37 C.F.R. 1.16 and 1.17, which may be required during the entire pendency of the application, except for the issue fee, to Deposit Account No. 16-0877.

Respectfully submitted,

By Christopher J. Kay  
Christopher J. Kay  
Registration No. 44,820

PENDORF & CUTLIFF  
5111 Memorial Highway  
Tampa, FL 33634-7356  
(813) 886-6085  
Dated: July 3, 2003

**EXPRESS MAIL CERTIFICATE**

"EXPRESS MAIL" MAILING LABEL NUMBER: EV330254863 US

DATE OF DEPOSIT: July 3, 2003

I HEREBY CERTIFY that the foregoing **Request for Nonprovisional Application** entitled "A PULSAR DRIVEN, HELIUM FREE TRANSVERSLY EXCITED ATMOSPHERIC-PRESSURE (TEA) CO<sub>2</sub> LASER" and a stamped receipt postcard are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. §1.10 on the date indicated and is addressed: **ATTN: Mail Stop PATENT APPLICATION, Commissioner For Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

The Commissioner is hereby authorized to charge any additional fees, which may be required at any time during the prosecution of this application without specific authorization, or credit any overpayment, to Deposit Account Number 16-0877.

Bonnie L. Horst  
Bonnie L. Horst



## A PULSER-DRIVEN, HELIUM FREE TRANSVERSLY EXCITED ATMOSPHERIC-PRESSURE (TEA) CO<sub>2</sub> LASER

### FIELD OF INVENTION

[0001] The present invention relates to a pulser driven, helium-free transversely excited atmospheric-pressure (TEA) CO<sub>2</sub> laser. The invention has potential applications in areas such as material processing (e.g. engraving, marking etc), isotope separation, scientific research, laser spectroscopy, medical research, and the like.

### BACKGROUND AND PRIOR ART

[0002] Helium plays a major role in the pulsed atmospheric pressure operation of a transversely excited CO<sub>2</sub> laser, commonly termed as TEA CO<sub>2</sub> laser, mainly in stabilising the discharge of the laser. Helium, with its very low electron affinity, facilitates the occurrence of an arc free discharge at atmospheric pressure and hence has been indispensable in the conventional operation of TEA CO<sub>2</sub> lasers. However, helium is an expensive and scarce gas and the use of helium in TEA lasers substantially increases the production as well as operational cost of such lasers. Several attempts have been made and number of special techniques have been employed in the past to obtain helium free operation of CO<sub>2</sub> lasers.

[0003] Such methods and their limitations are briefly described below-

1. **Low pressure CO<sub>2</sub> laser:** There exist many reports on helium free low pressure TE CO<sub>2</sub> lasers or helium free CW operation of low pressure CO<sub>2</sub> lasers. In these systems the low operating pressure intrinsically ensures glow mode operation of the discharge in absence of helium.

"EXPRESS MAIL" LABEL NO.: EV 33025486305  
I HEREBY CERTIFY THAT THIS PAPER IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE "EXPRESS MAIL POST OFFICE TO ADDRESSEE" SERVICE UNDER 37 CFR 1.10 IN AN ENVELOPE ADDRESSED TO: THE COMMISSIONER OF PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450, ON THIS DATE. THE COMMISSIONER IS HEREBY AUTHORIZED TO CHARGE ANY FEES ARISING HEREFROM AT ANY TIME TO DEPOSIT ACCOUNT 18-0877

7/3/03  
DATE

James J. Horvath  
SIGNATURE





SOLE/JOINT  
ATTY DOCK: 3875.023

## DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, mailing address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter, which is claimed and for which a patent is sought in the application entitled:

### A PULSER DRIVEN, HELIUM-FREE TRANSVERSELY EXCITED ATMOSPHERIC-PRESSURE (TEA) CO<sub>2</sub> LASER

This declaration is directed to:

the attached application  
(for original application)

Application No. \_\_\_\_\_  
filed \_\_\_\_\_, and amended on \_\_\_\_\_  
(for declaration not accompanying application)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed:

Application No.	Country	Filing Date	Priority Claimed (yes or no)
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I hereby claim the benefit of Title 35, United States Code §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in a listed prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge my duty to disclose any material information under 37 C.F.R. §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Application No.	Filing Date	Status (patented, pending, abandoned)
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I hereby appoint Stephan A. Pendorf, Reg. No. 32,665; Christopher Kay, Reg. No. 44,820; Yaté K. Cutliff, Reg. No. 40,577; Evelyn A. Defillo, Reg. No. 45,630; Carrie L. Bootcheck, Reg. No. 50,712 and Michael J. Bootcheck, Reg. No. 52,636, my attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and request that all correspondence about the application be addressed to Stephan A. Pendorf at Pendorf & Cutliff, 5111 Memorial Highway, Tampa, FL 33634-7356.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date <u>JUNE 30, 2003</u>	First Inventor <u>DARUBA J. BISWAS</u>	
	<small>First Name Middle Initial Last Name</small>	
Residence <u>same as mailing</u>	Signature <u>[Signature]</u>	
	Mailing Address <u>1C, Kailas, Anushaktinagar</u>	
	<u>MUMBAI</u>	
Citizenship <u>India</u>	<u>Mumbai - 400 094, INDIA</u>	

Date JUNE 30, 2003 Second Inventor JONVALAGADDA PADMA NILAYA  
First Name Middle Initial Last Name  
Residence same as mailing Signature [Signature]  
Mailing Address 17B, Kapilavastu, Anushaktinagar  
MUMBAI  
Mumbai - 400 094, INDIA  
Citizenship India

Date JUNE 30, 2003 Third Inventor Aniruddha KUMAR  
First Name Middle Initial Last Name  
Residence same as mailing Signature \_\_\_\_\_  
Mailing Address Building 85, Flat No. 13, BARC Staff Colony  
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